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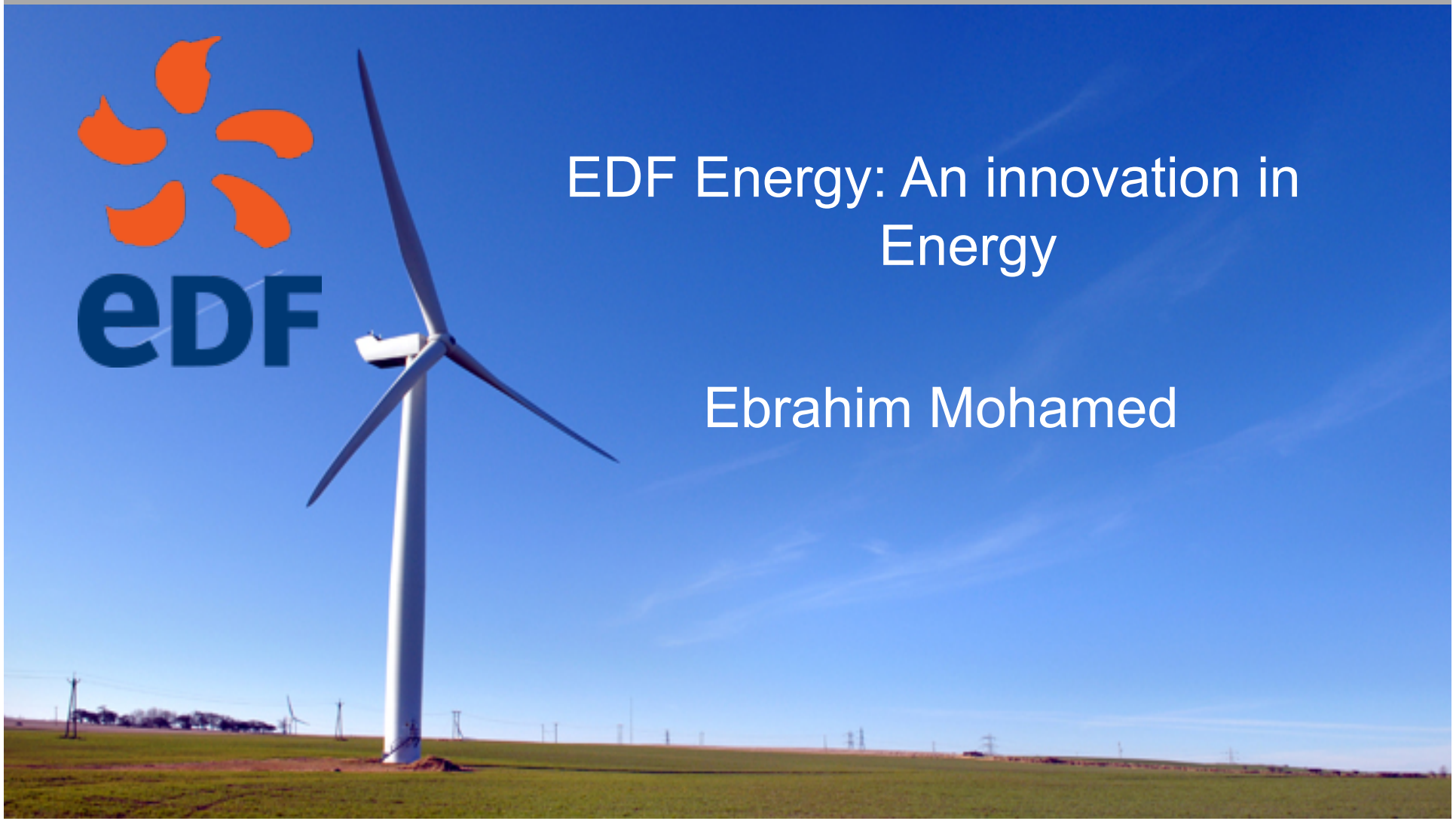
KIC - Climate Innovation Case Study



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Overview

- Introduction to EDF Energy
- Impact of Innovation within EDF Energy
- Impact of Human Resource Management within EDF Energy

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Case Study Workshop: Four Factors

Finance and Accounting

Marketing and Brand Management

Innovation

Leadership and Talent Management

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The Background

The EDF Group is the world's leading nuclear energy company, with solid positions in major European countries.

They are committed to investing in sustainable industrial growth, based on three core principles:

Leading the global nuclear revival

Fostering the development of renewable energies and energy efficiency

Consolidating our positions in Europe.

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The Background

History:

1946: A law nationalizing 1,450 French electricity and gas generation, transmission, and distribution companies led to the creation of Electricité de France (EDF).

1950's: EDF provided support and advice to its customers about the benefits of using electricity.

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The Background

1960s: The low cost of fossil fuels spurred on the construction of oil-fired power plants, like the one in Le Havre.

1973: With the oil crisis just on the horizon, oil was the primary source of electrical power, covering almost half of France's needs.

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The Background

1974-1989: In the wake of the oil crisis France turned to nuclear-powered electricity generation and announced its intention to build 13 nuclear power plants within two years. This initiative marked the beginning of France's energy independence.

1984: EDF began to export its nuclear expertise worldwide with the building of the Daya Bay power plant in China.

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The Background

2004: 70% of the electricity market was opened to competition. On November 19, we changed our corporate status to become a limited company. This shift created new commercial opportunities, including the marketing of multi-energy and service offers.

2006: The EDF Group has been implementing a €40 billion investment program to support an ambitious industrial and development strategy.

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The Background

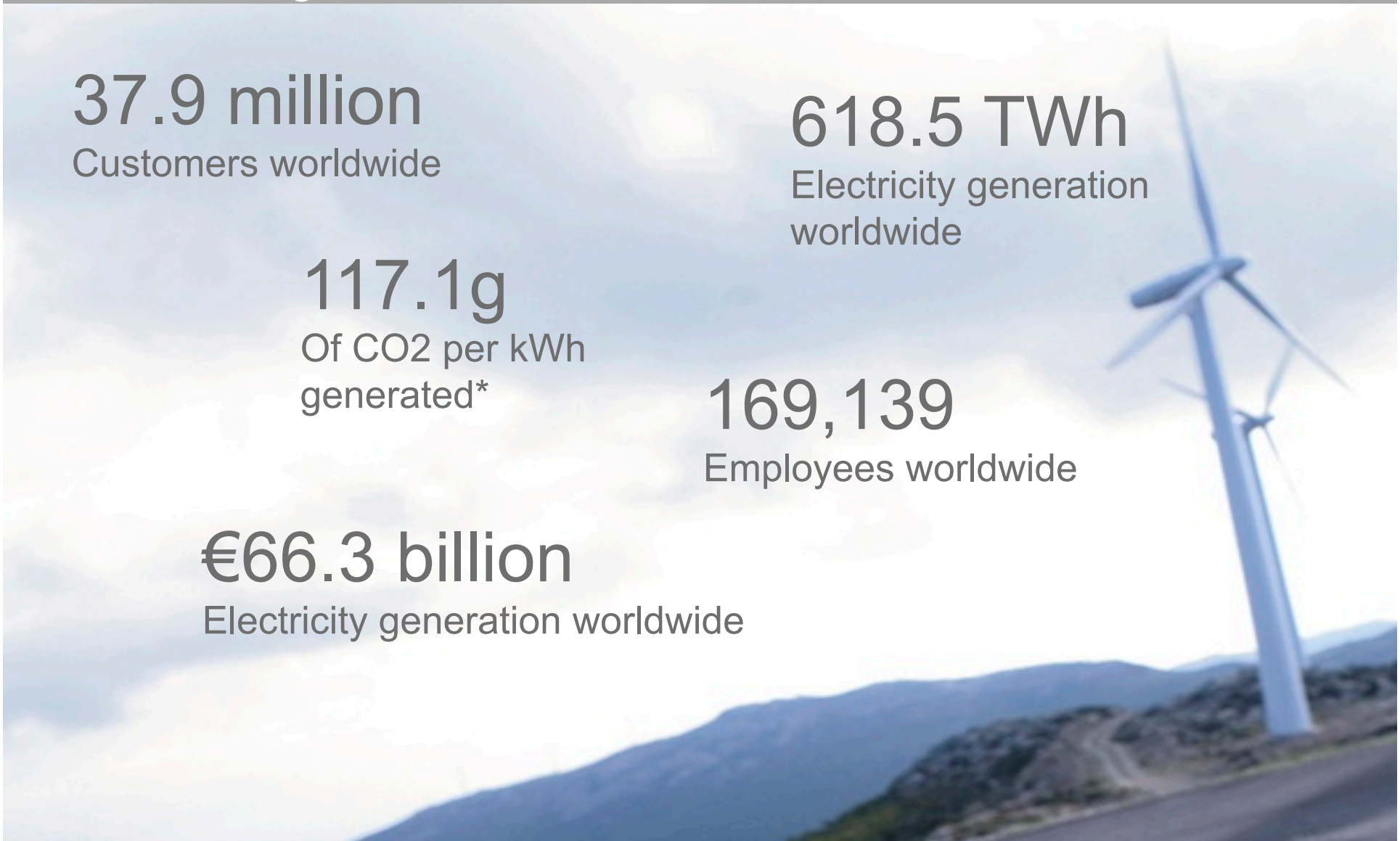
37.9 million
Customers worldwide

618.5 TWh
Electricity generation worldwide

117.1g
Of CO_2 per kWh generated*

169,139
Employees worldwide

€66.3 billion
Electricity generation worldwide



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Video on The EDF Group

http://about-us.edf.com/profile/our-group-43668.html

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EDF Energy

EDF Energy as we know it today was born in 2003

But our history actually began during the years leading up to 2002, when three energy companies – SEEBoard, London Energy and SWEB – were brought together.

The combination of EDF Energy and British Energy in 2009 forms one of the UK's largest energy companies. The combined business is the UK's largest producer of electricity.

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EDF Energy

British Energy

Powering the low carbon generation

EDF ENERGY networks

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EDF Energy UK

EDF's presence on the UK energy market is a major strand in the Group's development strategy.

With the acquisition of British Energy, the Group became a key player in the generation, distribution, and supply of electricity in the United Kingdom.

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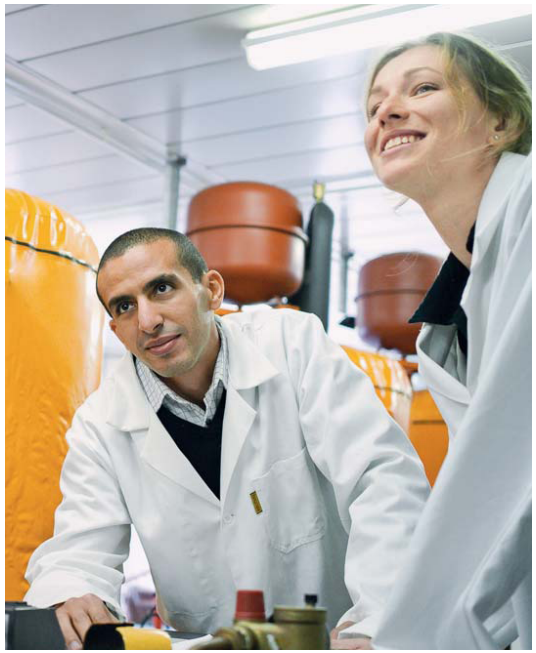
EDF Energy UK

EDF Energy generate around 7% of the UK's electricity and over a quarter of the UK population depend on them for electricity.

EDF Energy and British Energy employ nearly 20,000 people at locations across the UK.



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The Background

An integrated energy company, with a presence in a wide range of electricity-related generation, transmission and distribution, supply and energy trading.

Activities in competition — Generation

Regulated Activities — Transmission

Distribution

Activities in competition — Energy Selling

Trading

EDF ENERGY networks

EDF group is an integrated energy company active in all businesses

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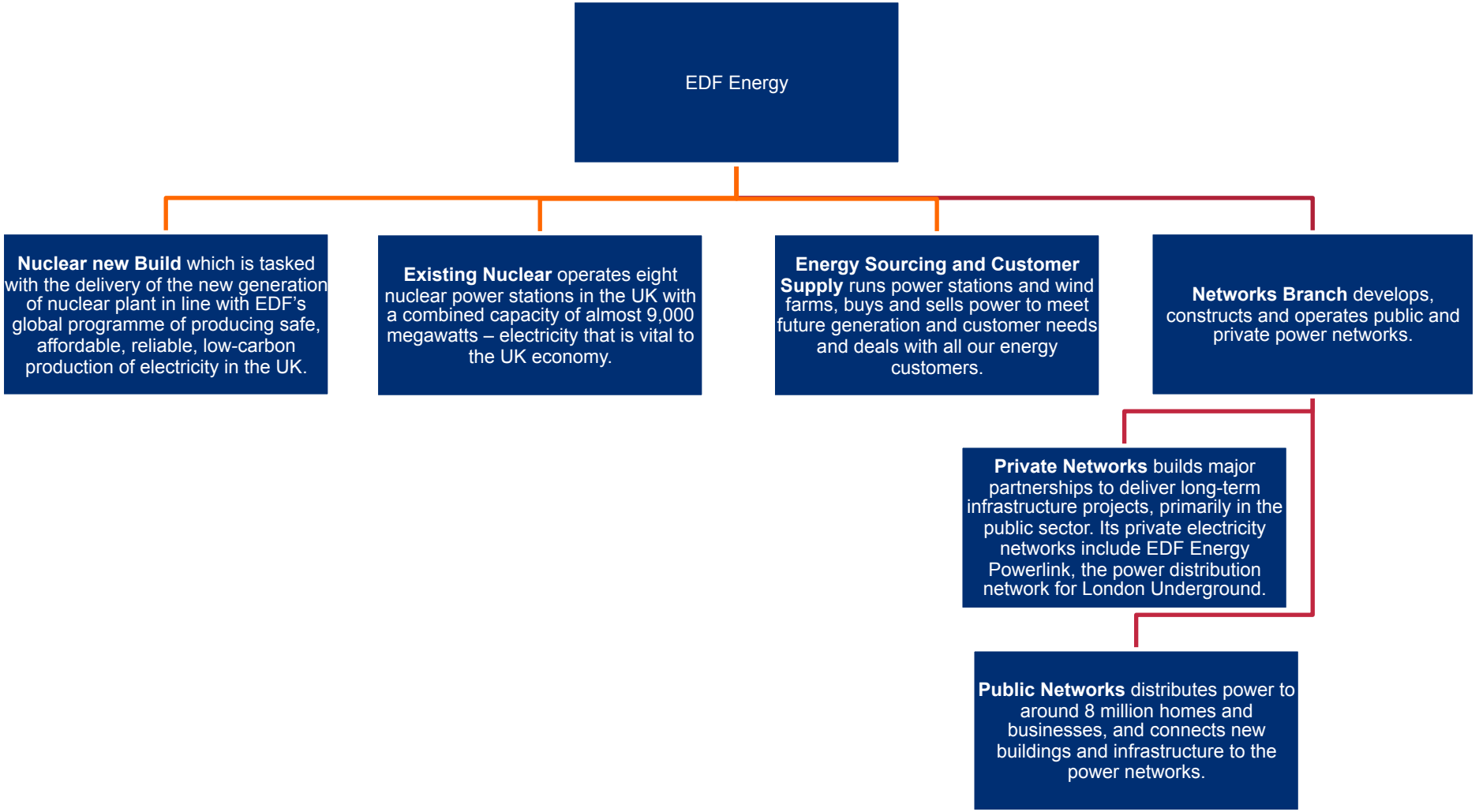
The Background



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The Background

Fuel Mix Information – Where Energy Comes From						
Coal %	Natural Gas %	Nuclear %	Renewable %	Other %	CO2 emissions per kg/kWh	Radio active Waste per g/kWh
46	14	33	4	3	0.555	0.0017

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Innovation

EDF Energy is committed to research and development as it is key to preparing for its future.

The group employs 2,000 researchers, 30% of which are women , and shares its skills in partnerships with research centres abroad.

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Innovation

EDF's commitment to preparing for the future is crystallized in 12 challenges surrounding six topics:

Our Planet:

- Anticipating climate-related constraints on water that is a shared resource
- Reducing the environmental impacts of the Group facilities.

Our optimisation:

- Anticipating the new energetic landscape
- Optimising EDF's generation on the market, rebuilding methods and tools
- Finding new flexibilities between consumption, generation and storage

Networks:

- Preparing 2015 distribution

Customers:

- Houses and buildings developing eco-efficient technologies and services
- Industry developing the efficiency of uses and new electricity uses

- Simulating to decide

Generation:

- Extending the operating life of nuclear power plants
- Integrating new technologies for a more competitive operation
- Innovating in renewable energies and storage

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Innovation

The generation mix of the EDF group:

EDF has the largest pool of generating resources in Europe, representing about 15% of the total capacity in Europe.

http://businesses.edf.com/edf-worldwide/activities-43760.html

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Innovation

The generation mix of the EDF group:

Nuclear Power: is central to the generation of competitively priced, safe and CO_2 emission-free electricity. EDF has a fleet of **58 nuclear PWRs** (pressurised water reactors) spread over 19 sites.

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A growing number of countries believe nuclear energy could be an Effective response to the earth's energy and environmental challenges.

EDF's view is that there can be no global solution without nuclear.

EDF's main nuclear ambitions for the future:

Invest in 10 EPR's worldwide by 2020 (two of them in France).

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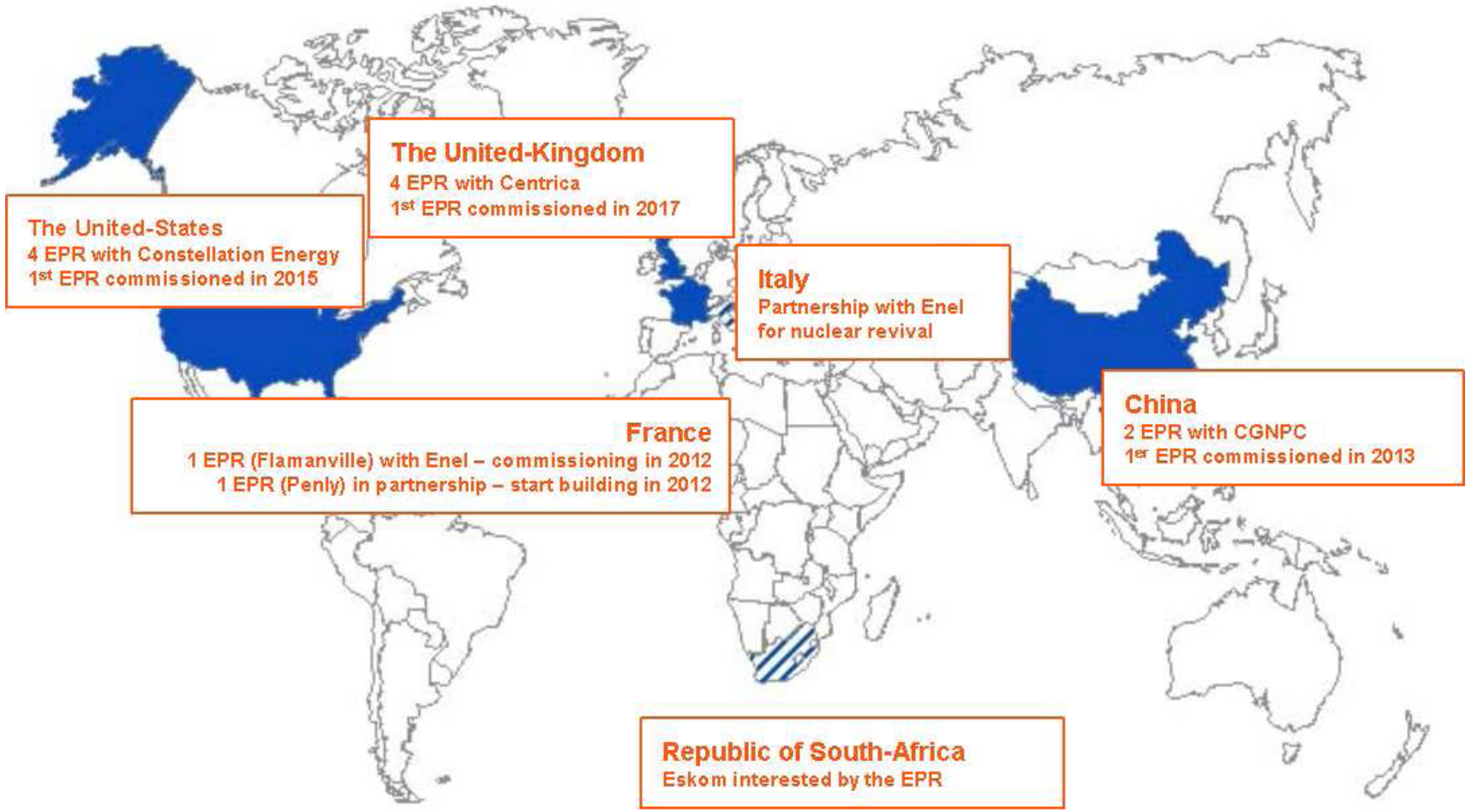
Innovation



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Innovation

The generation mix of the EDF group:

Marine Energy: EDF has been a pioneer in the use of marine energies. Energy from the sea is a source of electricity that is safe, inexhaustible, and CO_2-free.

EDF estimates the workable European capacity to be around 12.5 GW, or the equivalent of twelve 900 MW nuclear reactors.

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Innovation

EDF's latest projects in Marine Energy:

The technology is not yet mature, but EDF is working on developing it to supplement the Group's existing generation assets.

• In 2011 EDF will bring on line a farm of 3 to 4 tidal turbines off the coast of Paimpol and Bréhat

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The generation mix of the EDF group:

Hydropower: Water is EDF's main source of renewable energy. Hydropower is environmentally friendly and does not contribute to the greenhouse effect or air pollution as it does not emit CO_2 or gas pollutants.

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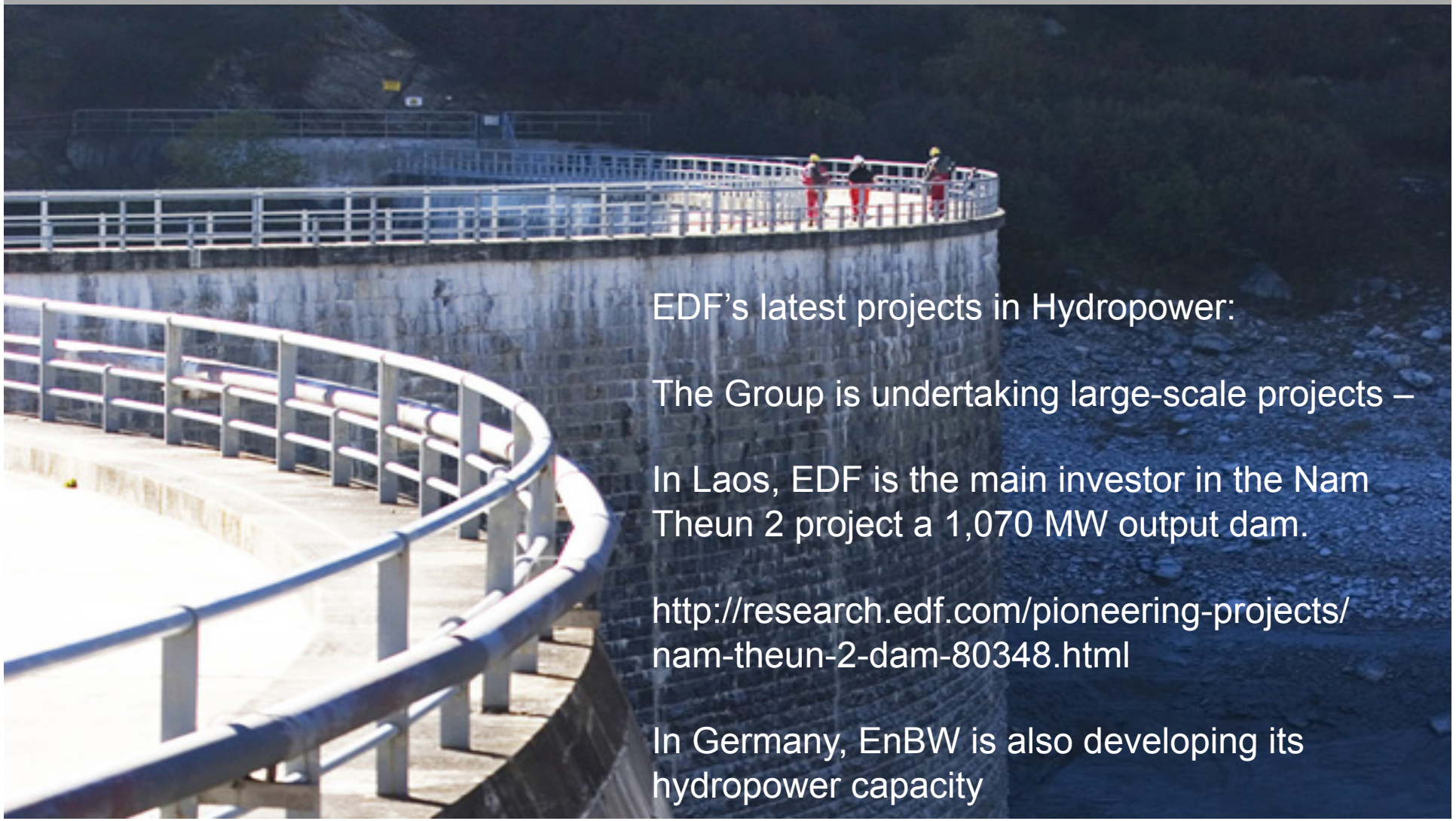
Innovation



EDF's latest projects in Hydropower:

The Group is undertaking large-scale projects –

In Laos, EDF is the main investor in the Nam Theun 2 project a 1,070 MW output dam.

http://research.edf.com/pioneering-projects/nam-theun-2-dam-80348.html

In Germany, EnBW is also developing its hydropower capacity

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Innovation

Solar Energy: the most abundant resource on the planet, is an energy of the future. This market is experiencing an annual growth rate of 30%.

Solar energy has two forms:
Photovoltaic solar energy, on isolated sites or connected to the grid to generate electricity;

Thermal solar energy, which converts the sun's rays to heat in order to produce hot water.

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Innovation

EDF's latest projects in solar energy :

• In 2008, EDF EN commissioned its first major installations (just over 20 MWp), including the largest photovoltaic power plant in France (7 MWp), located in Narbonne.

• The company is continuing to expand its portfolio with projects totalling a capacity of more than 2,000 MWp in France, Italy, Spain, Greece, Canada, and the United States.

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Geothermal Energy:

Geothermal energy involves capturing the heat in the Earth's crust to either exploit it or to use it to generate electricity.

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Innovation

EDF's latest projects on geothermal energy:

EDF is involved in the construction of the first unit of this type in the world, under the umbrella of a European research project. This power plant has an electricity output of 1.5 MW and will enable the Group to develop new technology using the geothermal energy in aquifers.

In the long term, the Group plans to develop more hot fractured rock power plant.

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Biomass: Biomass is the second most used renewable energy in the world. It enables heat and electricity, or even fuel, to be produced through the combustion of waste and organic matter residue.

There are two main types:

Ligneous biomass: This is wood, wood by-products, and straw, etc. Such biomass is chiefly used in combustion-based processes.

Fermentable biomass: This is organic waste (liquid manure and residues, household waste, etc.). This biomass is initially converted into biogas by micro-organisms.

Future biomass projects by EDF include:

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Wind Power: One of the most environmentally-friendly energy generation methods

EDF has continued to pursue its development in wind power, its primary area of growth.

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Innovation

EDF'S future projects within wind power:

In France, the company commissioned 20% of new capacities linked to the national network in 2008, creating three of the most powerful wind farms in the country: Villesèque (51 MW), Chemin d'Ablis (52 MW), and Salles-Curan (87 MW)

In Europe, EDF EN commissioned several very large wind farms in 2008, of which the most noteworthy are in Portugal: Ventominho (240 MW) and Arada (92 MW). In 2009 the first stage of the C-Power offshore wind farm was commissioned in Belgium (30 MW of a future total of 300 MW)

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Innovation

In 2007 most of the research done by EDF Energy was devoted to work undertaken in direct response to the challenges faced by the business specialisms.

Generation: to improve the operating performance, optimise the life of the means of production in complete safely and anticipate new environmental demands.

Energy Management: to optimise EDF's generation facilities and improve the flow of exchanges at European level by focusing on renewable energy developments.

Networks: to integrate new technologies that improve and develop technical solutions that increase the life of materials and maximise the transit capacity of built structures.

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Innovation

Commercial Development: to develop customer relations support tools and methods and eco-efficient solutions for all customers.

Renewable energies: to nurture the most promising technologies, such as solar and marine energy.

Information technologies: to provide the company with decision-making tools on complex subjects such as managing the physical margins of nuclear power stations.

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Task

'With the EDF innovation landscape in mind and taking into account the groups members respective backgrounds, discuss whether you agree with the EDF vision, identify and rank order the group members with the most relevant backgrounds to the opportunities that are highlighted.'

1. *Hydro-energy*
2. *Eco-technologies*
3. *Nuclear energy*
4. *Global issues (smart grids and power balancing etc.)*
5. *Simulation*

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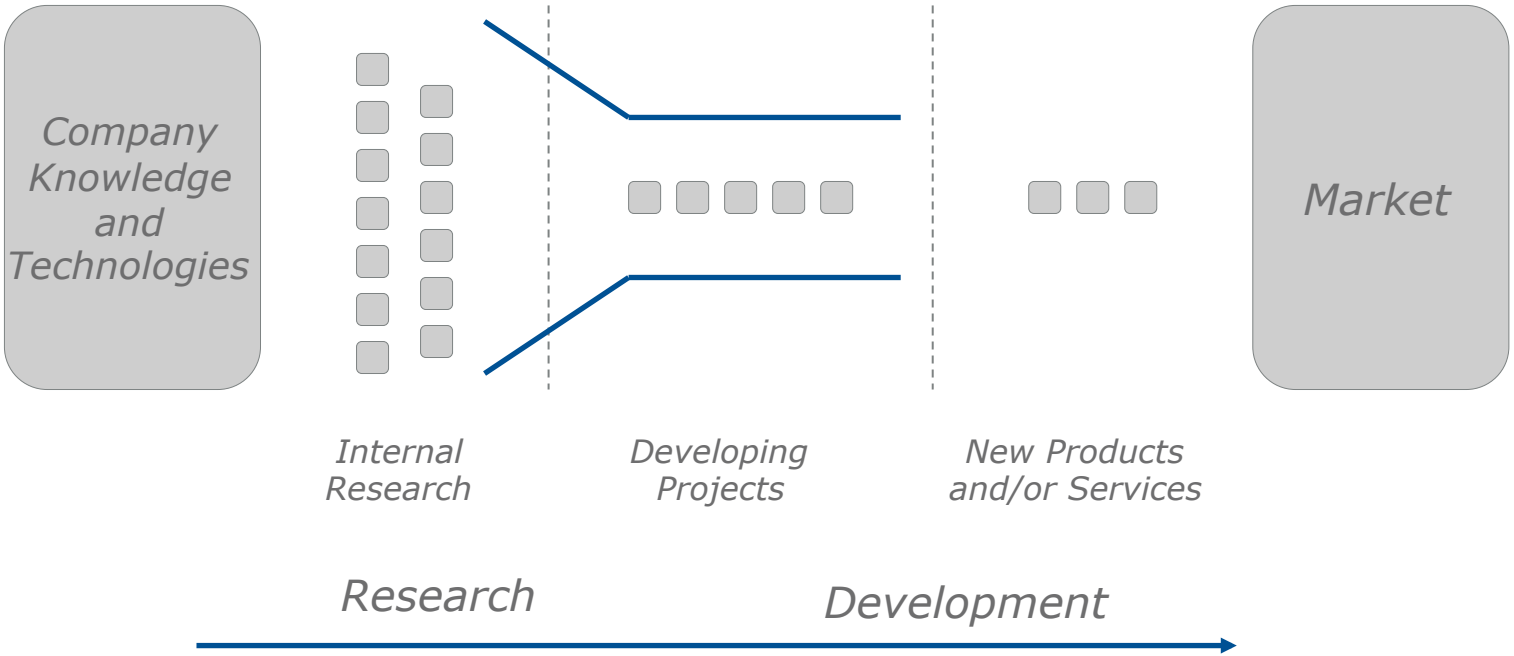
Traditional Innovation Model



…taken from Chesbrough, "Open Innovation", HBSP (2003)

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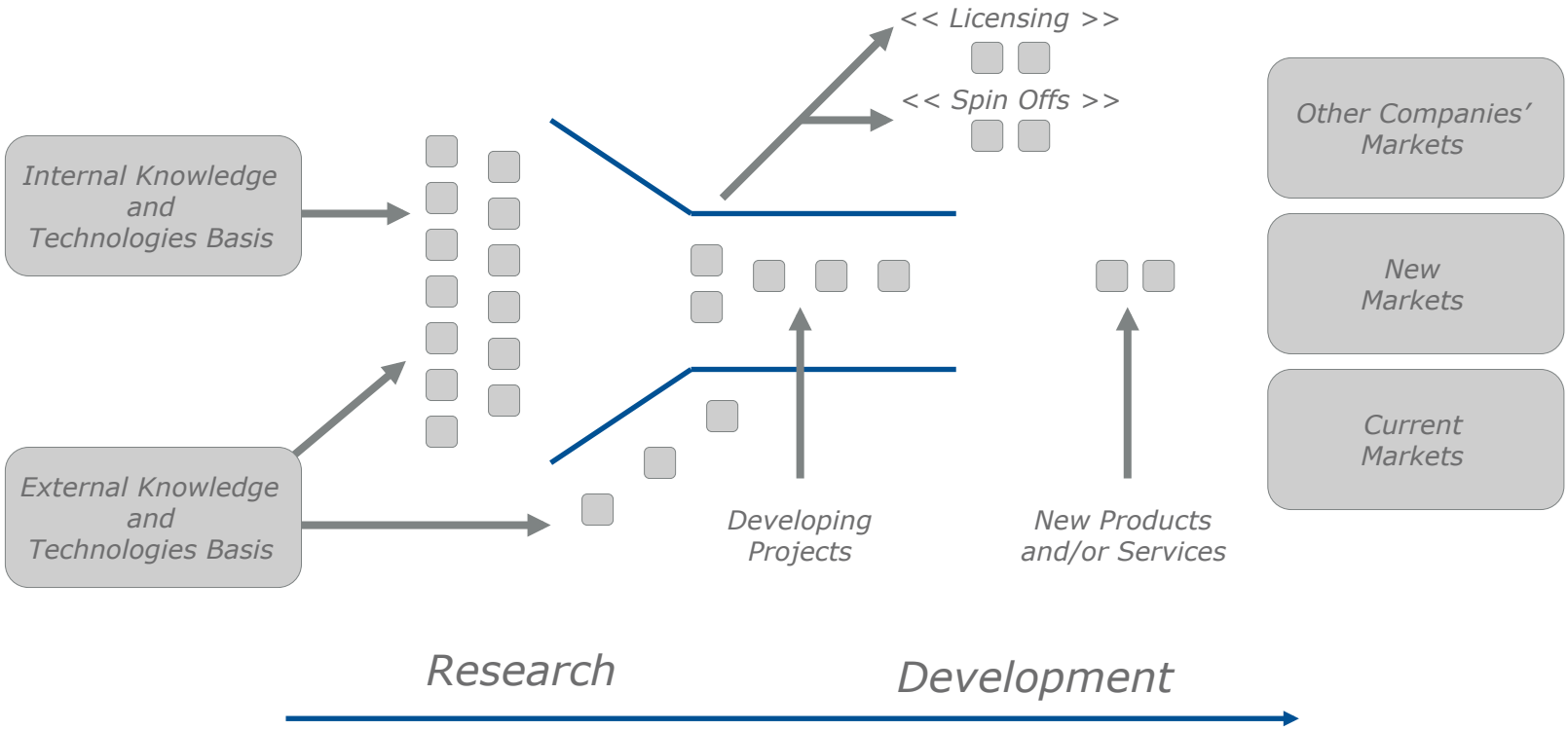
The Open Innovation Model



…taken from Chesbrough, "Open Innovation", HBSP (2003)

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Marketing & Brand Management

Save today. Save tomorrow.

In 2008 following the world wide trend of climate concern the company launched a series of advertisements with the slogan 'It's not easy being green' to target a newer green eco-friendly image.

http://www.youtube.com/watch?v=vKlC7iGzi-M

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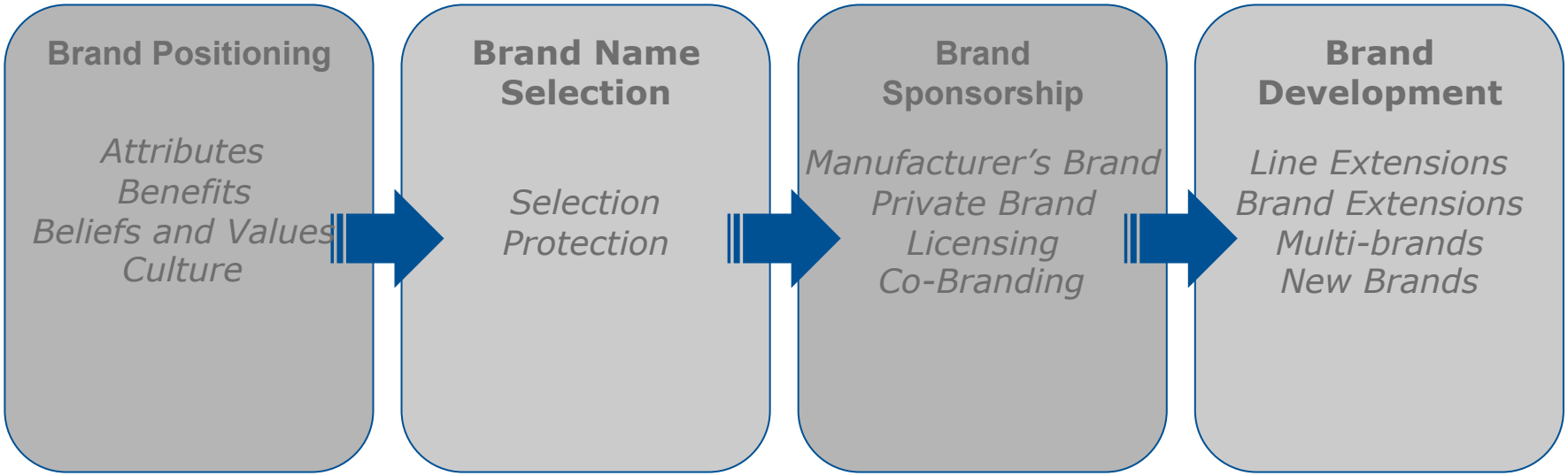
Major Brand Strategy Decisions



…taken from Kotler, Wong, Saunders, Armstrong, "Principles of Marketing", Pearson/Prentice-Hall (4th Ed. 2005)

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Marketing & Brand Management

EDF's commitment to sport dates back many years.

EDF is one of the official sponsor and sustainability partner of the 2012 London Olympic Games and Paralympic Games.

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Marketing & Brand Management

The Group has chosen to support sports which are closely related to its role as an energy company and the values promoted by all of its employees: respect for individuals, environmental responsibility, striving for excellence, a commitment to the community, and the necessity for integrity.

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Finance & Accounting

EDF is committed to investing in sustainable industrial growth, based on three core principles:

- Leading the global nuclear revival
- Fostering the development of renewable
- energies and energy efficiency
- Consolidating our positions in Europe.

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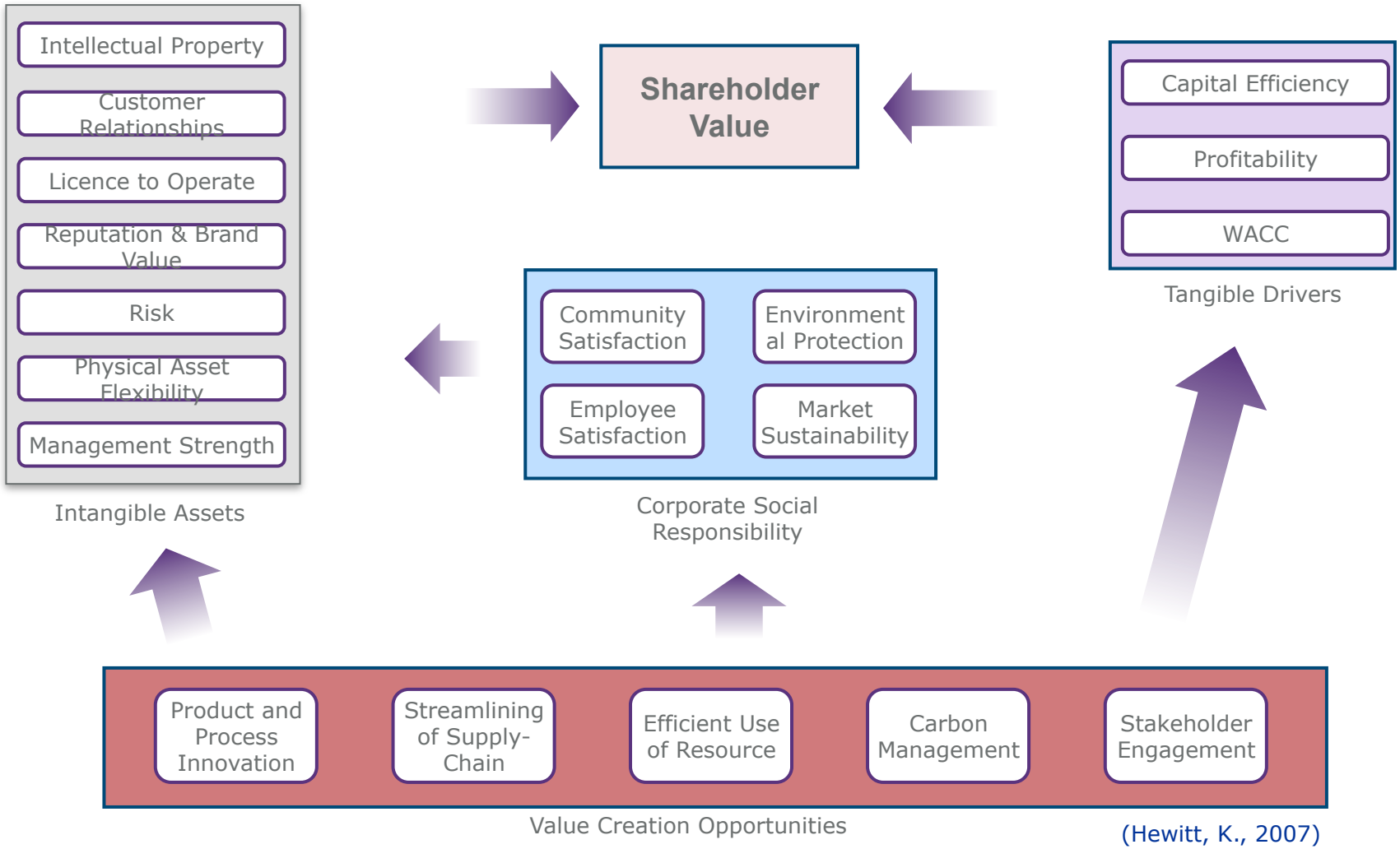
Finance and Accounting Fundamentals



(Hewitt, K., 2007)

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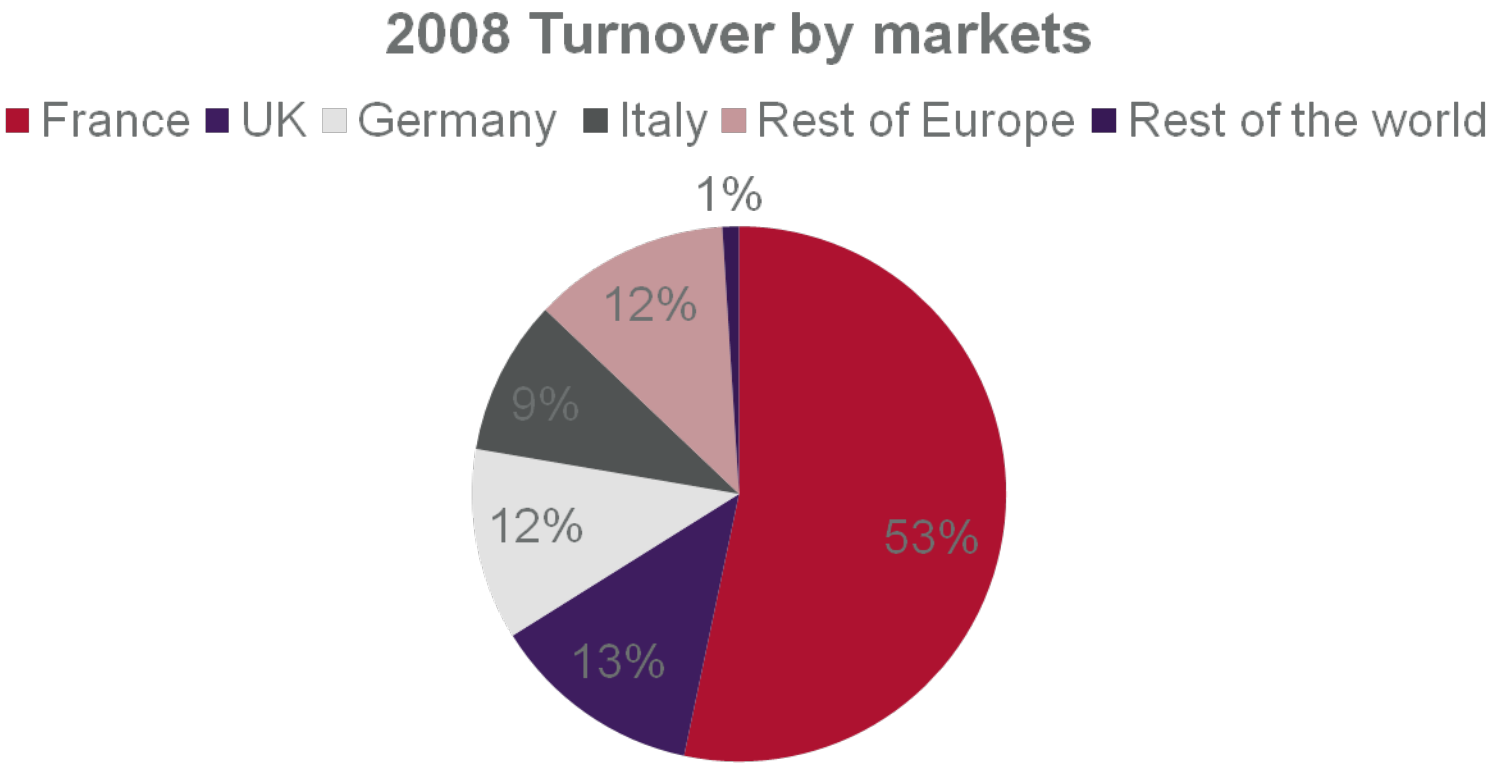
Finance & Accounting

Europe, EDF's reference market.



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Finance

3 year stock chart for EDF Energy (EDFEF)

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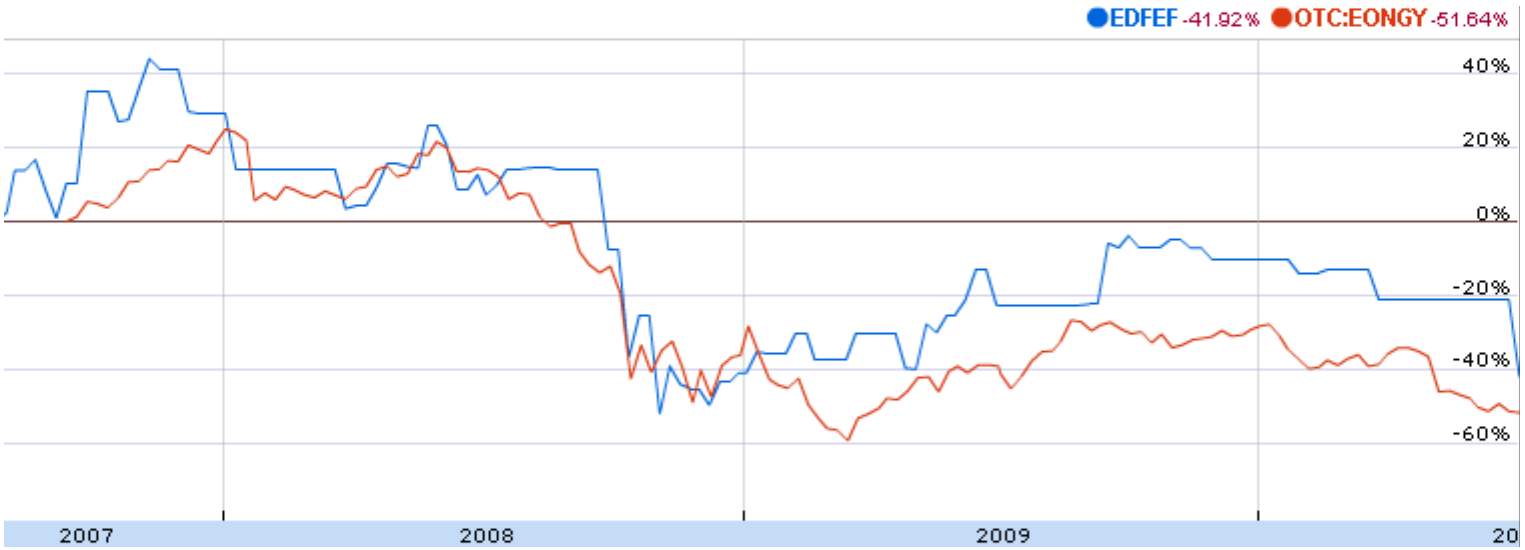
Finance



3 year comparison chart EDF Energy (EDFEF) vs. E.ON Energy (EONGY)

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Finance

3 year comparison chart EDF Energy (EDFEF) vs. Renewable Energy Development Corp (RWED)

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Finance

3 year comparison chart EDF Energy (EDFEF) vs. Scottish & Southern Energy (SSEZF)

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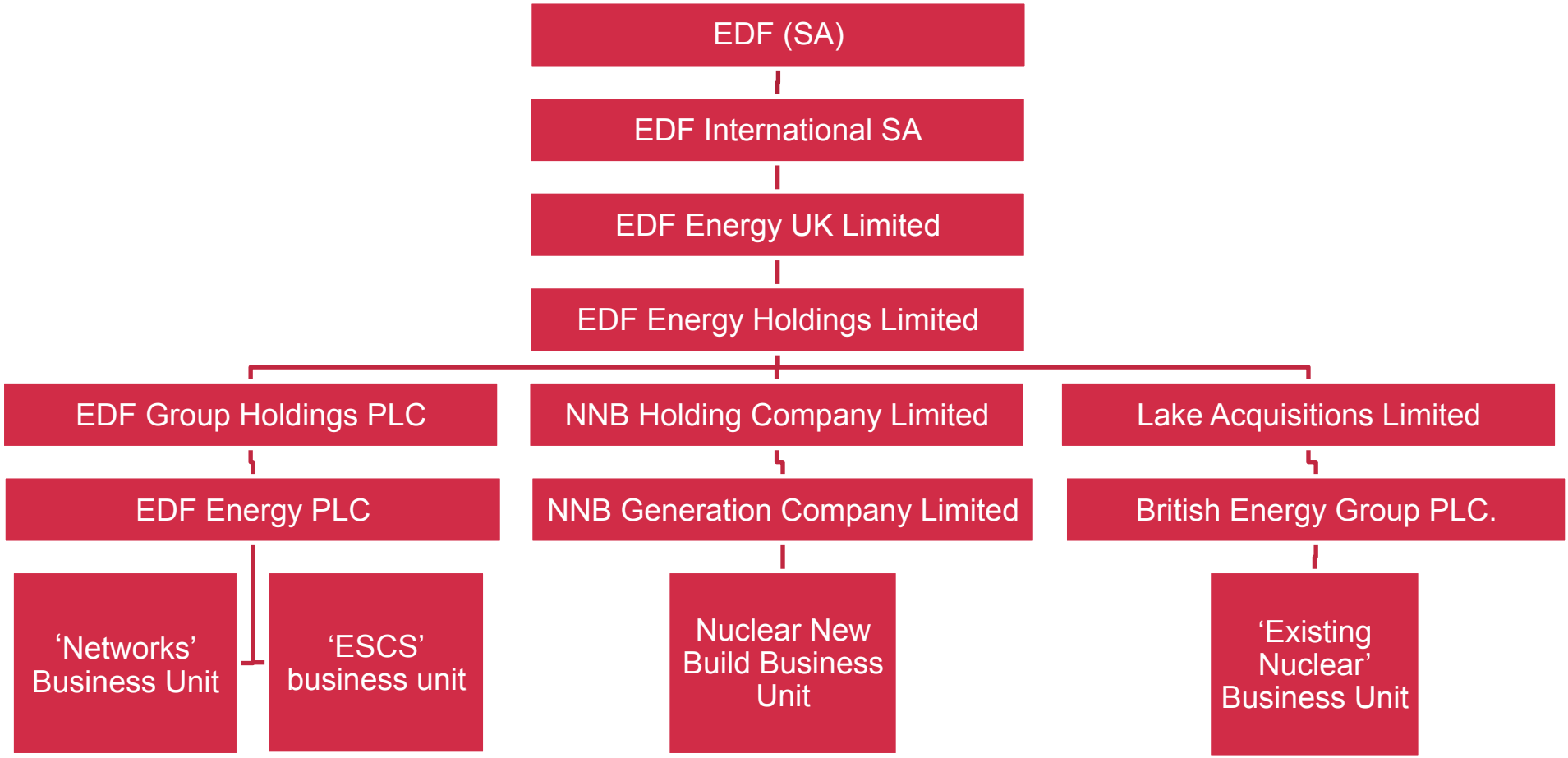
Leadership & Human Resource Management



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Leadership & Human Resource Management

Our five key values:

- Respect for individuals
- Environmental responsibility
- Striving for excellence
- Commitment to the community
- The necessity of integrity

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Leadership and Human Resource Management

The Leading Change Model

- *Establishing a sense of urgency*
- *Forming a powerful guiding coalition*
- *Creating a vision*
- *Communicating a vision*
- *Empowering others to act on the vision*
- *Planning for and creating short term wins*
- *Consolidating improvements and producing still more change*
- *Institutionalising New Approaches*

Kotter, John P. (1995)